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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/657,971	09/08/2000	Nobumasa Suzuki	35.C11969 REI	3511

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EXAMINER	
ALEJANDRO MULERO, LUZ L	
ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 05/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/657,971	Applicant(s) SUZUKI, NOBUMASA	
	Examiner Luz L. Alejandro	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-110* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-110* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

Claim 110 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. It appears that claim 110 should depend on claim 109 instead of depending on claim 108.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 19-25 and 50-110 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 19, 50, 60, 68, 78, and 86, the phrase "whereby increased slot density providing a uniform high-density plasma is obtained" renders the claims indefinite because it is unclear how shortening the wavelength of microwaves in the waveguide will allow an increased slot density. It is possible that the shortening of the wavelength will provide a high density plasma, but the slot density is not changed based upon the particular wavelength of the microwaves, since the slot density relates to the structure of

the waveguide and is controlled during manufacture of the apparatus. Clarification is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 19-25 and 50-110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki, JP 7-90591 in view of Inoue, JP 5-62796 and Watanabe et al. JP 7-263186.

Suzuki shows the invention as claimed including a microwave plasma processing apparatus, in which a plasma process is performed, comprising: a plasma generation chamber 1101, separated from ambient air by a first dielectric material 1102; a processing chamber 1111 connected to said plasma generation chamber; means 1113 for supporting a substrate 1112 to be processed; microwave introduction means utilizing an endless annular wave guide 1103 provided outside the first dielectric material which is provided with plural slots1107; means 1108 for introducing gas into the plasma generation chamber; means 1115 for introducing gas into the processing chamber; evacuation means 1116 (see figures 9A and 9B).

Suzuki does not expressly disclose that the interior of the wave guide is filled with a second dielectric material which is the same as or different from the first dielectric

material. Inoue (figs. 1 and 2 and their descriptions) and Watanabe et al. (figs. 1 and 2 and their descriptions) disclose microwave plasma processing apparatuses similar to the apparatus disclose by Suzuki, and in which the wave guide is filled with a dielectric material as to generate a uniform density plasma in the plasma generation chamber as disclosed by Inoue (paragraph 0022) and as to make the transmission section of microwaves small and to make small the cut off frequency of the waveguide as disclosed by Watanabe et al. (paragraphs 0004-0011). In view of these disclosures, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by Suzuki as to further comprise a wave guide filled of dielectric material because in such way a uniform density plasma is generated, therefore the substrate is uniformly processed, to make the transmission section of microwaves small and as to make small the cut off frequency of the wave guide. With respect to claims 72 and 90, note that the first dielectric material is quartz and the second dielectric material can be Teflon, alumina ceramics or quartz (see Watanabe et al. paragraph 0007), therefore the limitation of the claims is met.

Suzuki et al disclose a wave guide having a cylindrical shape and which follows the exterior of the first dielectric material. Suzuki also disclosed: that the wave guide may also be of other shapes such as a disk, a polygon, or the like (paragraph 0018); magnetic field generating means may be further provided to higher the density of plasma (paragraph 0021), such magnetic field generating means capable of generating the claimed magnetic field of claim 74; optical energy source to irradiate the substrate (paragraphs 0038-0039); high frequency supply means connected to the substrate

support (paragraph 0041); and wherein film forming and cleaning processes are performed in the apparatus, also with respect to the processes performed in the apparatus noted that the apparatus is capable of performing different kinds of processes depending in the gases utilized.

With respect to claims 99-110, the Suzuki reference discloses the claimed limitations, see paragraph 0019 and claim 3.

Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Applicant is advised that should claim 108 be found allowable, claim 110 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Allowable Subject Matter

Claims 1-18 and 26-49 would be allowable if a corrected declaration is provided.

Response to Arguments

Applicant's arguments filed 12/11/02 have been fully considered but they are not persuasive. The declaration under 37 CFR 1.132 filed 12/11/02 is insufficient to overcome the rejection of claims 19-25 and 50-110 based upon Suzuki, JP 7-90591 in view of Inoue, JP 5-62796 and Watanabe et al. JP 7-263186 as set forth in the last Office action because: a showing of unexpected results has not been made in the above mentioned rejection. Note that the reasons provided by Inoue and Watanabe et al. to include a dielectric within the waveguide are the same reasons as those of applicant and that expected beneficial results are evidence of obviousness of a claimed invention, just as unexpected results are evidence of unobviousness thereof (see In re Gershon, 372 F.2d 535, 538, 152 USPQ 602, 604 (CCPA 1967)). Furthermore, it is not clear how the reduction in the wavelength of the standing wave relates to an increased slot density. It appears that the slot density relates to the structure of the waveguide and is controlled during manufacture of the apparatus. One of ordinary skill in the art at the time the invention was made would have adjusted the slot density in the apparatus of Suzuki, JP 7-90591 in view of Inoue, JP 5-62796 and Watanabe et al. JP 7-263186 based upon the particular value of the standing wave wavelength that would be expected to be shorter than an apparatus without a dielectric in the waveguide.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Luz L. Alejandro
Primary Examiner
Art Unit 1763

May 13, 2003